DOCUMENT RESUME

ED 076 693 TM 002 702

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TITLE An Alternative to Ability Grouping: Personality Grouping.
PUB DATE 73
NOTE 16p.; Paper presented at annual meeting of American Educational Research Association (New Orleans, Louisiana, February 25-March 1, 1973)

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS Academic Achievement; Grade 6; *Grouping (Instructional Purposes); *Grouping Procedures; *Homogeneous Grouping; Mathematics Instruction; Personality Assessment; *Student Characteristics; *Teacher Characteristics; Technical Reports

ABSTRACT

This study attempted to broaden the perspective of homogeneous classroom grouping strategies through an examination of a grouping plan which matched both students and their teachers on the basis of compatible levels of specific personality characteristics. The focus of the study was to examine empirically the degree of relationship that existed between a series of noncognitive grouping criteria, defined as personality characteristics, and the cognitive outcomes of classroom instruction in mathematics. It was found, in general, that personality grouping was feasible on the basis of certain specific personality characteristics, but more research is needed to study different groups, other content areas, and other personality grouping criteria. (Author)

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An Alternative to Ability Grouping: Personality Grouping

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Presented at the 1973 Annual Meeting of the
American Educational Research Association

February 26 - March 1, 1973
New Orleans, Louisiana

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Grouping as a mode of educational behavior has its origin as far back as the nineteenth century. An examination of its lineage indicates that it was not until the 1920's and 1930's that grouping reached a peak, suffered from a lack of interest throughout the late 1930's and 1940's, then during the 1950's and '960's experienced a rebirth within the schools (Ream, 1968).

The term 'grouping' is used by educators to denote the process of classifying pupils for instructional purposes on the basis of predetermined criteria (Olson, 1966). Pupils may be grouped on the basis of chronological age, sex, mental test scores, reading ability, interests, behavior, achievement in a particular subject or number of subjects, or any combination of these and other characteristics. Theoretically, the essential purpose of any grouping practice is to encourage the greatest individual growth within the group setting. More practically, grouping is used to reduce the range of individual differences to simplify the teaching tasks.

Ability grouping is the most popular method for homogeneous classroom grouping in the United States today. A recent survey has found that approximately 77 per cent of the nation's public schools use ability grouping in some form (Findley and Byran, 1971). However, despite the rather apparent popularity of ability grouping, research evidence does not support its continued application for classroom instruction (Eash, 1961; Ream, 1968; Findley and Byran, 1971). Although it has been practiced for over three quarters of a century, research

has failed to demonstrate any clear and consistent evidence which would guarantee the superiority of outcomes of instruction based on ability grouping.

Large scale reviews of the literature provide no conclusive evidence as to the consistent advantages or disadvantages of ability grouping. For example, Eash (1961) in his review and summary has concluded that ability grouping may be detrimental to children in average achieving and lower achieving groups, while Wilhelm and Westby-Gibson (1961) reported that if any group has gained, it has been the lower achievement group. Continuing a step further, the research evidence reported by Findley and Byran (1971) led them to conclude that it is the higher-achieving groups that will demonstrate the greatest scholastic achievement, and therefore benefit most from ability grouping.

Despite the apparent diversity in evaluation, opinion, and practice with regard to ability grouping, there appear to be three major areas of agreement:

1. Ability grouping has yet to prove itself as an administrative device to meet both effectively and efficiently the individual needs of all pupils in most areas of educational concern.

2. More and better research is needed to measure or control a larger number of variables involved.

3. Objectives, materials, curriculum and teaching methods should also change when instructing groups at different ability levels.

With almost one hundred years of research evidence, the usefulness of ability grouping as a method of homogeneous grouping remains clouded. What must be done, as most investigators suggest, is to conduct research that will examine and control more and different classes of variables in an effort to justify the use of grouping procedures.

The present study has attempted to broaden the perspective of homogeneous classroom grouping strategies through an examination of a grouping plan which would match both students and teachers in the classroom on the basis of compatible levels of specific personality characteristics. The focus of this

study was to examine empirically the degree of relationship that existed between a series of non-cognitive grouping criteria, defined as personality characteristics, and the cognitive outcomes of classroom instruction. If meaningful relationships were to be found between these variables, then the value and feasibility of personality grouping could be further explored.

Method and Procedures

Six-hundred and four (604) sixth grade students sampled from 21 classes, and 11 of their teachers, served as subjects in this study. The content area under investigation was mathematics, and each student was assessed on each of four indices of mathematics achievement: arithmetic computation, arithmetic concepts, arithmetic application as measured by the Stanford Mathematics Achievement Battery, and the classroom grade of each student in mathematics as assigned by that student's mathematics teacher at mid-year. The 11 teachers participating in the study were the mathematics instructors of these students. Only classrooms in which the mathematics instructor was a female were studied. The four measures of student achievement in mathematics were treated as the dependent variables in this investigation.

Students and their mathematics teachers were measured on six personality characteristics: sociability, ego-strength, dominance, outgoingness, sensitivity, and guilt-proneness. These traits were assessed using the appropriate scales of Cattell's Children's Personality Questionnaire Forms A and B (1963) for students, and Cattell's 16 Personality Factors Questionnaire Forms A and B (1967) for teachers. Student and teacher trait scores as derived by these scales served as the independent variables in the study.

In addition to the mathematics achievement and personality traits scores of each student, indices of teacher effectiveness and adequacy of curriculum materials in mathematics were obtained for teachers as perceived by their students. These two variables were employed as statistical covariates, and were obtained using the School Mathematics Survey developed by Torrance and Parent (1966).

Tests of all research hypotheses in this study were made for male and female students separately. The hypotheses tested examined the zero-order product moment correlations between each index of student mathematics achievement and each of the personality trait scores of students, and the correlation between assessed student achievement and the students' mathematics teachers' personality traits. Regression analyses were then employed to study the predictions for each dependent variable based on the six student personality characteristics. To answer the question of the feasibility of personality grouping for mathematics instruction, a grouping took place when the score of a student and the score of his or her teacher on each of the six personality traits could both be classified as either high or low scores for a particular trait as defined by the test manual. Whenever a sufficient number of students and their teachers were grouped into a category for a particular trait multiple regression analysis was performed to predict each dependent variable of mathematics achievement using the indices of teacher effectiveness and adequacy of curriculum materials as covariates, and the trait scores of those students and their teachers on that trait as independent variables. The squared multiple correlations of each prediction were then examined to determine the efficiency of each prediction.

Results

Table 1 presents zero-order correlations between the four cognitive variables of mathematics achievement and the six personality indices measured for both male and female students. These results parallel the findings observed by the majority of past research that has examined the relationship between personality characteristics and cognitive achievement variables (Lavin, 1965). Although many of the correlations were found to be statistically different from zero for both males and females, the majority of these correlations for these groups were less than $\pm.20$.

Insert Table 1

The pattern of relationship among these variables for males and females read to be similar. For both male and female students the correlations for ego-strength and guilt-proneness with each index of mathematics achievement were the largest observed. Particularly for the male students, the inter-correlations among these variables were most pronounced. Interesting to note is that the pattern of significant coefficients for arithmetic concepts and arithmetic application across the six personality indices for both the males and the females were similar, while the pattern of significant correlations tended to be the same between arithmetic computation and the students' assigned classroom grade for the male and female groups.

Table 2 presents the correlations computed between male and female achievement in mathematics and the six measured teacher personality traits.

Insert Table 2

The correlations between teacher personality and male student mathematics achievement tended to differ from the pattern observed for the female students and the same teachers. The greatest number of significant correlations were found between the teacher's personality and the student's assigned classroom grade in mathematics. At this level of analysis, the implication would seem to be that the direct assessment and evaluation by the teacher of pupil achievement in mathematics is related to specific personality characteristics of the teacher. In general, although statistically significant correlations were found between student achievement in mathematics and characteristics of personality of their mathematics teachers, the overall degree of these relationships tended to be rather low.

The data reported in Table 3 represent the squared multiple correlations found in predicting each dependent variable, having covariated out the indices of teacher effectiveness and the adequacy of curriculum materials, then using both the student and teacher paired indices on each personality trait.

Insert Table 3

Although many of these predictions were found to be statistically significant, the percent of variance observed to be accounted for in the dependent variables, for both males and females was low. In most cases, the inclusion of the teacher variable did not statistically increment the existing

prediction beyond what had already been accounted for by the student paired trait ($p < .10$).

Following these predictions students and teachers were grouped. Both high and low groupings for each trait were formed on the basis of students and teachers who each scored above or below established limits on the CPQ and 16 PF. Table 4 presents the number of students and teachers which constituted these groups.

Insert Table 4

Table 5 presents the resulting squared multiple correlations for the prediction of each index of mathematics achievement for males and females and their paired teacher trait once groups had been established.

Insert Table 5

Most apparent in these predictions is the lack of consistency of the predictions for the male and the female students. Also, although many of the statistically significant predictions are quite large, one must consider the rather limited sample size from which these squared coefficients have been extracted.

The absence of coefficients for female students in the high outgoingness grouping resulted from a lack of observations in this category, therefore this analysis was not computed.

Discussion and Conclusions

As a first consideration, the matter of being able to identify potentially effective personality grouping criteria is not easily completed by observation of the correlation which exists between student achievement and assessed indices of personality on these students. Perhaps a more effective index, particularly for male students, for identifying potentially meaningful personality grouping variables is the correlation between the teacher trait and the measures of student achievement. Although the evidence was not conclusive, the greater the observed correlation between the particular teacher trait and achievement, the more likely was that trait to be found as an effective grouping criteria. This result was noted for males when teacher dominance scores and outgoingness scores were correlated with achievement in mathematics, and groupings for either high or low scorers on these traits were later judged as effective patterns. It must be cautioned however, that this sequence did not ensure that both the high and low matched groupings would both be effective, nor was such a pattern evident for the female students studied on these variables. The implication is that the degree of relationship between student achievement and teacher personality will to some extent assist in defining effective personality grouping patterns.

Empirically, this research has demonstrated that grouping on the basis of selected levels of particular personality characteristics of the student and the teacher in mathematics instruction at the sixth grade level can be effectively employed if the criterion of academic achievement is desirable. It must be emphasized that this conclusion is specific for the variables studied, and the students and teachers who participated in this research. The generalizability of these results apply solely to the parent population of which the sample was representative.

While certain of the personality grouping patterns studied did support this conclusion, the implications of personality grouping must be explored. What cannot be overlooked is the distinction between statistical significance and the practical significance of the findings. For many of the grouping patterns for both males and females it was found that a 'statistically significant' relationship existed. However, the relationship only explained a fraction of total criterion variance. For example, the low personality grouping pattern on the trait sociability for females accounted for approximately 15 percent of criterion variance for each of the three standardized indices of mathematics achievement. Even though these predictions were computed as statistically significant ($p < .10$), the actual efficiency of these predictions considering what might be termed the effectiveness of personality grouping on this personality variable is certainly questionable recognizing that 85 percent of criterion variability remains unaccounted for.

Of the grouping patterns examined only three groupings for males, and two groupings for females demonstrated high relationships between student achievement and student and teacher personality. The low grouping pattern on the traits sociability ($R^2 = .59$) and outgoingness ($R^2 = .64$), and the high grouping on dominance ($R^2 = .76$) for male students were judged effective. For female students the high ($R^2 = .54$) and the low ($R^2 = .57$) groupings on ego-strength were judged effective.

From the results of this research two remaining implications exist concerning the feasibility of personality grouping. First based on the results of this investigation, if personality grouping was to be adopted as a grouping methodology for those patterns judged effective male and female students would have to be instructed in mathematics separately. There was no overlap between males and females for grouping patterns judged effective, although three patterns

for males and females both resulted in statistically significant prediction of mathematics achievement. Those patterns were identified as the low groupings on sociability, outgoingness, and dominance.

The second implication is that if personality grouping based on the findings of this research was to be adopted as a classroom grouping procedure only a very limited number of students and female mathematics instructors could participate in instruction of mathematics at the sixth grade level. These last two considerations do not reflect favorably on the practicality or feasibility of personality grouping.

References

Cattell, R. B., et al. Handbook for the CPQ. Champaign, Illinois: 1963, Institute for Personality and Ability Testing.

Cattell, R. B., et al. Handbook for the 16 PF. Champaign, Illinois: 1967, Institute for Personality and Ability Testing.

Eash, M. J. Grouping: What have we learned? Educational Leadership, 1961, 18, Pp. 429-434.

Findley, W. G., & Bryan, M. W. Ability grouping: 1970 Center for Educational Improvement, January, 1971, University of Georgia.

Lavin, D. E. The prediction of academic performance. New York: Russel Sage Foundation, 1965.

Olson, W. D. Ability grouping: Pros and cons. PTA Magazine, 1966, 60 (4), Pp. 24-25.

Ream, M. A. Ability grouping. NEA-Research Division. Washington, D. C., 1968.

Thelen, H. Classroom grouping for teachability. New York: John Wiley, 1967.

Torrance, E., & Parent E. Characteristics of mathematics teachers that affect student learning. Cooperative Research Project No. SAE-8993, United States Office of Education, 1966.

Wilhelms, F., & Westby-Gibson, D. Grouping research offers leads. Educational Leadership, 1961, 18, Pp. 410 413

Table 1

Correlations Between Student Achievement in Mathematics and the Personality Traits

	Computation		Concepts		Applications		Class Grade	
	M	F	M	F	M	F	M	F
Sociability	.17*	.17*	.07	.11*	.14*	.18*	.14*	.18*
Ego-strength	.37*	.18*	.37*	.15*	.39*	.21*	.34*	.20*
Dominance	.09	-.02	.13*	.10*	.12*	.15*	.05	-.07
Outgoingness	.14*	.13*	.10*	.01	.12*	.08	.13*	.13*
Sensitivity	-.01	.00	-.02	.07	-.06	.03	-.09	.03
Guilt-proneness	-.28*	-.22*	-.28*	-.17*	-.36*	-.18*	-.29*	-.20*

* $p < .10$

Table 2

Correlations Between Student Achievement in Mathematics and Teacher Personality Traits

	Computation		Concepts		Application		Class Grade	
	M	F	M	F	M	F	M	F
Sociability	-.07	-.02	-.08	.01	-.04	.01	.11*	.22*
Ego-strength	.04	.21*	.01	.06	-.06	.05	-.20*	-.08
Dominance	-.11*	.09	-.12*	.08	-.11*	.06	.07	.28*
Outgoingness	-.12*	.11*	-.12*	.02	-.12*	.02	-.10*	.13*
Sensitivity	.05	.06	-.02	-.08	-.02	.02	-.08	-.14*
Guilt-proneness	.02	-.14*	.08	.01	.08	-.02	.18*	.04

* $p < .10$

Table 3

Predictions of Mathematics Achievement for Males and Females Employing Matched Indices of Student and Teacher Traits Prior to Grouping

	Computation		Concepts		Application		Class Grade	
	M	F	M	F	M	F	M	F
Sociability	.04*	.04*	.05*	.018	.06*	.05	.04*	.09*
Ego-strength	.14*	.09*	.16*	.04*	.17*	.07*	.14*	.09*
Dominance	.03	.02	.06*	.03*	.06*	.04*	.01	.11*
Outgoingness	.04*	.03*	.06*	.00	.07*	.02	.03*	.06*
Sensitivity	.01	.02	.04*	.02	.05*	.02	.02	.05*
Guilt-proneness	.09*	.07*	.12*	.04*	.17	.05	.11	.07*

* $p < .10$

Table 4

Number of Students and Teachers Used in Prediction of Mathematics Achievement After Grouping Occurred

	Males		Females		Teachers	
	High	Low	High	Low	High	Low
Sociability	26	40	20	55	4	4
Ego-strength	17	17	16	30	4	3
Dominance	24	24	25	18	4	3
Outgoingness	14	34	7	46	2	4
Sensitivity	61	16	46	14	4	3
Guilt-proneness	29	28	36	28	5	3

Table 5

Prediction of Mathematics Achievement for Males and Females
Employing the Matched Indices of Student and Teacher Traits After Grouping Occurred

		Computation		Concepts		Application		Class Grade	
		M	F	M	F	M	F	M	F
Sociability	High	.39*	.28*	.31*	.13	.33*	.12	.30*	.16
	Low	.27*	.15*	.16	.15*	.15	.16*	.18	.34*
Ego-strength	High	.29	.45*	.16	.40*	.26	.47*	.27	.40*
	Low	.39	.33	.11	.78*	.17	.57*	.11	.44
Dominance	High	.13	.54*	.18	.07	.16	.19	.21	.10
	Low	.54*	.45	.57*	.03	.78*	.01	.64*	.54*
Outgoingness	High	.42	-	.54*	-	.46*	-	.32	-
	Low	.46*	.25*	.30*	.06	.35*	.13	.12	.32*
Sensitivity	High	.16*	.02	.05	.16	.14*	.09	.04	.07
	Low	.15	.41	.30	.37	.24	.32	.36	.15
Guilt-proneness	High	.06	.24*	.09	.06	.06	.11	.24	.27*
	Low	.01	.18	.06	.16	.11	.15	.07	.27

*p < .10